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Central Asia Regional Transmission Planning Project

WORKPLAN: August 2007 * – August 2008

Introduction

Project CARTRANS will assist the transmission system operators in developing a regional transmission system model to analyze power flows in the Central Asian power system. This load flow model will support analyses used to identify potential bottlenecks in the regional transmission system that may result from changes in network elements, or constrain trade within the region and between the region and neighboring electricity markets. Development of this technical model complements work on market design and policies issues to show if the regional transmission network has sufficient capacity to facilitate trade as markets in Central Asia develop and mature.

Elaboration of this project shall be performed by Working Group (WG) consisting of members of electric power utilities and transmission system operators from Kyrgyzstan (NESK), Tajikistan (Barki Tojik), Kazakhstan (KEGOC) and CDC Energia, and potential members from Uzbekistan (Uzbekenergo), and Turkmenistan (Turkmenenergo).

The CARTRANS Project is scheduled for period from August 2007 till August 2008 and it should be concluded with the publication of the final report. The report should depict all weak points in transmission grid in Central Asia as well as indicative values of Net Transfer Capacities on borders between participating transmission system operators (TSOs).

The participating TSOs and CDC will be able to exchange forecast data in a common format and examine with their neighbors, the regional consequences of developing domestic generation and transmission. This will be accomplished by introduction of Siemens/PTI PSS/E software to the participants through several PSS/E training courses. Though it was conceived as a regional project designed to promote cooperation among the eight participating TSOs and CDC, each of the participating TSOs and CDC may use the project software and newly created national transmission models to significantly improve their domestic planning capabilities and system operations.

* - the Workplan includes the activity conducted in August 2006

The activities proposed in this workplan are designed to build the institutional and technical capacity of the TSOs and CDC to engage in regional planning and cooperation. Toward this end, the workplan proposes the following subject areas:

- Training for development of a load flow model of the transmission networks of power systems of Central Asia;
- Review the transmission planning criteria used in each participating country.
- Development of regional transmission system model which includes grids of all participating countries with neighbor equivalents
- Performing steady state analyses (load flow and contingency) on developed regional models with calculation of cross border transfer capacities;

Training for, and Development of, a Central Asia Load Flow Model

An initial activity of the Working Group will be to conduct a four day training program on the use of the PSS/E software for the development of national transmission models for load flow calculation purposes. Following the training, the TSOs and CDC will commence discussion on the input data for the model, begin data collection and the development of a common technical library, and then move step by step toward the development of a common load flow model.

It is expected that draft national and regional models will be developed by the conclusion of this stage of the Project and analyzed in the ensuing stages.

USEA will enter into a contract with a consultant to assist with the development of the national load flow models, integrate them into a regional model and eventually update the static model based on input from the participating TSOs and CDC. In this phase of the project USEA will purchase the PSS/E software required to construct the national and regional models.

Development of the 2012 steady state model

Starting from existing status of networks for the year 2008, the participants will develop national models by incorporating the most recent information regarding ongoing/new projects until 2012. As a result of changing consumption patterns of electricity in the region, the participants will develop a 2012 summer minimum and winter maximum load models and use it to analyze the network based on the trading scenarios posited in the first phase of the Project.

Performing analyses on the steady state model concerning the possible bottlenecks, voltage problems and transfer capacities

Power systems of Central Asia have been in parallel operation between themselves and with Russia since the formation of Soviet OES interconnection, now inherited by IPS/UPS. Since the control and development of such large power system was centralized in previous period, it would be interesting to analyze the steady state operation of TSOs of Central Asia in a long term planning horizon. This time, the decentralized (national based) transmission system planning approach will be used. Results of load flow and contingency analyses would point out all weak points in Central Asia transmission grid as well as technical limitations in future cross border energy trading on regional market.

Program Activities and Goals

Date: August 2007.

Program: PSS/E software training, CARTRANS project presentation

Location: Bishkek, Kyrgyzstan

Purpose: Conduct Load Flow Modeling Training

Participants: Two representatives of Kyrgyzstan and Tajikistan

Expected Accomplishments: Trained two staff of Kyrgyzstan and two staff of Tajikistan for work on PSS/E

Deliverables: First drafts of national transmission system models of Kyrgyzstan and Tajikistan are to be developed by the end of 2007.

Date: January 2008.

Program:

- PSS/E software training,
- Working Group Meeting
- Steering Committee Meeting

Duration: 4 days of training and one day steering committee & working group meeting

Location: Bishkek, Kyrgyzstan

Purpose:

- Conduct Load Flow Modeling Training;
- Agree to data format;
- Establishment of Scenarios (as requested by CDC);

- Presentation of CARTRANS project to all participants (all countries of Central Asia)

Participants: One or two Representatives from each of the Participating TSOs and CDC

Expected Accomplishments:

- Trained Staff of Participating TSOs and CDC for work on PSS/E;
- Mutual agreement on data collection process;
- Establishment of scenarios for load flow models;
- Definition of communication patterns.

Deliverables: During this period, from January through April, the participating TSOs and CDC will send their national load flow models for year 2012 in PSS/E format and Excel Tables (only corrections) to the model integrator, which will be responsible for integrating them into the draft regional model to be reviewed at the next working group meeting

Date: Last Week of May 2008

Program: Working Group Meeting

Location: To be Determined

Duration: 2 days of working group meeting

Purpose:

- Review National Load Flow Model Development;
- Approval of the Load Flow Models;
- Assistance and Support in model development; and
- Review Planning Criteria Used in the Central Asia Electrical Systems

Participants: Two Representatives from each of the Participating TSOs and CDC

Expected Accomplishments:

- Mutual agreement on further data collection process;
- Harmonized plans for transmission grid development until 2012;
- Identification of regional energy balance.

Deliverables:

- Draft National Load Flow Models;
- Draft Regional Load Flow Models (with graphical representations)

Date: July 2008

Program: Working Group Meeting

Duration: 2 Days

Location: To be Determined

Purpose:

- Review Updated National Load Flow Models;
- Completion of final Regional Transmission System Model;
- Implementation of Transfer Capacity Calculation; and
- Definition of Technical Criteria which will be used for Load Flow and Contingency Analyses

Participants: Two Representatives from each of the Participating TSOs and CDC

Expected Accomplishments:

- Completion of national load flow models;
- Integration of all updates of national load flow models into regional models;
- Adoption of analyses to be conducted on regional model

Deliverables:

- Final Regional Load Flow Models (with graphical representations)
- A final report will be produced as the outcome of scheduled meeting in July.

Date: Last week of August 2008

Program: Steering Committee Meeting

Location: To be Determined

Duration: 2 Days

Purpose:

- Finalization of the phase one of CARTRANS project;
- Finalization of the Report;
- Recommendations for next Phase Workplan

Participants: Two Representatives from each of the Participating TSOs and CDC

Expected Accomplishments:

- Completion and approval of CARTRANS project report;
- Identification of possible extension of project in future phases.

Deliverables: Final report (in written and electronic form) of CARTRANS project